


<b>Notice of Allowability</b>	Application No.	Applicant(s)	
	10/065,738	OKUBO ET AL.	
	Examiner	Art Unit	
John Juba, Jr.	2872		

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to proposed amendment of May 26, 2004 and telephone interview of June 28, 2004.
2. ☒ The allowed claim(s) is/are 3-5, 8 and 10-21.
3. ☒ The drawings filed on 11/14/2002 with replacement 10/21/2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |   |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                       |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                               |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance              |
|   | 9. <input checked="" type="checkbox"/> Other <u>PTOL-303 advisory action.</u>                     |

  
**JOHN JUBA, JR.**  
**PRIMARY EXAMINER**

***Examiner's Amendment***

An extension of time under 37 CFR 1.136(a) is required in order to make an examiner's amendment which places this application in condition for allowance. During a telephone conversation conducted on June 28, 2004, Mr. James Judge requested an extension of time for 1 MONTH(S) and authorized the Director to charge a credit card the required fee of \$ 530 for this extension and authorized the following examiner's amendment. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

**In the Specification:**

Paragraph [0101] now reads as shown in the attached replacement paragraph.

**In the Claims:**

Claims 3 – 5, 8, 10, 11, 13, 16, and 17 have been amended to read as shown in the attached consolidated listing of claims, which listing replaces all prior versions of the claims in this application.

***Reasons for Allowance***

The following is an examiner's statement of reasons for allowance: Claims 3 - 5, 8, 10 – 15 and 18 – 21 are allowable for the reasons previously set forth with respect to the subject matter of claims 3, 8, and 14. Claims 16 and 17 are allowable over the prior

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art of record since the prior art, taken alone or in combination, fails to teach or fairly suggest a diamond-like carbon thin film having the recited extinction coefficient, particularly wherein the diamond-like carbon film is an *amorphous* diamond-like carbon film, as now recited in claim 16.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Interview Summary***

On June 28, 2004 Examiner Juba contacted Mr. James Judge to indicate that the amendment of May 26, 2004 proposed under 37 CFR 1.116 had not been entered. The examiner identified an informality the proposed change to the specification, and noted that in line 2 of claim 8, "said" should be stricken. Applicants' representative indicated that the informality noted in the Office copy of claim 8 may be an artifact of facsimile transmission and subsequent scanning into the record, since Applicants' copy shows this text as lined-through. The examiner proposed a change in line 2 of claim 4 as would avert any possible ambiguity as to which multi-layer film is further limited. Insofar as any change to the claims would require formal examiner's amendment (rather than informal), the extension of time was necessary for entry of the amendment. Applicants' representative authorized an examiner's amendment adopting the substantive claim amendments proposed in the May 26, 2004 amendment, with minor additional changes


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to claims 4 and 8, and a change to the specification at a different location. Agreed that Applicants' credit card fee authorization form would not be part of the Official record, and that a written petition for extension of time was not required, the petition constructively having been made during the telephone interview.

Post-allowance papers should be mailed to **Box Issue Fee**. Post-allowance papers may also be faxed to correspondence branch in PUBs. The fax number is (703) 308-5083. The **PUBs customer service** number is (703) 305-8497.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Juba whose telephone number is (571) 272-2314. The examiner can normally be reached on Mon.-Fri. 9 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Drew Dunn whose number is (571) 272-2312 and who can be reached on Mon.- Thu., 9 - 5.

  
**JOHN JUBA, JR.**  
**PRIMARY EXAMINER**  
**Art Unit 2872**

June 28, 2004  
amendment to spec. att'd  
claims listing att'd

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SPEC (06/28/2004)

[0101] As an example of the film-formation conditions with the parallel plate plasma CVD method: for substrate size, a 30-cm square; for film-formation-substrate temperature, 200 degrees centigrade, and pressure,  $1.3 \times 10^1$  to  $1.3 \times 10^{-1}$  Pa; for flow-volume of methane as the precursor gas, 100 sccm; apply a high frequency of 13.56 MHz at a power of approximately 100 W. Vacuum vessel: rotary pump and expansion pump, pressure-control with an orifice. It will be appreciated that the film thus obtained is an amorphous diamond-like carbon layer.

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CLAIMS (06/28/2004)

Claims 1 – 2 (canceled)

Claim 3 (currently amended): ~~The A Faraday rotator set forth in claim 1 wherein~~  
said having wavelength selectivity, for selectively rotating only the polarization plane of  
incident light of given wavelengths, the Faraday rotator comprising:

a magneto-optical section is constituted from a gadolinium iron garnet thin films  
in between which at least one dielectric layer is interlaminated to create at least two  
magneto-optical parts for rotating the polarization plane of incident light of at least two  
wavelengths traveling in the direction in which the magnetic field of said magneto-  
optical section is oriented; and

dielectric multi-layer films in which a low refractive-index layer and a high  
refractive-index layer are laminated in alternation, disposed on each side of said  
magneto-optical section in an arrangement together with said magneto-optical section  
predetermined to create a resonant structure for localizing within said magneto-optical  
section incident light of at least two wavelengths.

Claim 4 (currently amended): The Faraday rotator set forth in claim [1] 3, wherein  
said dielectric multi-layer [film is] films are composed by laminating in alternation an  
oxide of silicon as a low refractive-index layer, and an oxide of titanium as a high  
refractive index layer.

Claim 5(currently amended): The Faraday rotator set forth in claim [1] 3, wherein said magneto-optical section and said dielectric multi-layer films are formed integrally by a vapor-phase process.

Claims 6 and 7 (canceled)

Claim 8 (currently amended): ~~The~~ An optical isolator ~~set forth in claim 6, wherein~~ having wavelength selectivity, for selectively blocking only return beams from incident light of given wavelengths, the optical isolator comprising:

a magneto-optical section is constituted from a gadolinium iron garnet thin films in between which at least one dielectric layer is interlaminated to create at least two magneto-optical parts for rotating the polarization plane of incident light of at least two wavelengths traveling in the direction in which the magnetic filed of said magneto-optical section is oriented;

a magnetic part for applying a magnetic filed to said magneto-optical section;

dielectric multi-layer films in which a low refractive-index layer and a high refractive-index layer are laminated in alternation, disposed on each side of said magneto-optical section in an arrangement together with said magneto-optical section predetermined to create a resonant structure for localizing within said magneto-optical section incident light of at least two wavelengths;

a polarizer for extracting polarized components from incident beams; and

an analyzer utilized in combination with said polarizer.

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Claim 9 (canceled)

Claim 10 (currently amended): The optical isolator set forth in claim [6] 8, wherein said dielectric multi-layer films are composed by laminating in alternation an oxide of silicon as a low refractive-index layer, and an oxide of titanium as a high refractive index layer.

Claim 11 (currently amended): The optical isolator set forth in claim [6] 8, wherein said polarizer and said analyzer are lent a structure having distributed refractive indices, by irradiating with either a particle beam or an energy beam a diamond-like carbon thin film along a bias with respect to the film's thickness direction.

Claim 12 (original): The optical isolator set forth in claim 11, wherein said particle beam is an ion beam, an electron beam, a proton beam,  $\alpha$  - rays, or a neutron beam; and said energy beam is light rays, X-rays or  $\gamma$  - rays.

Claim 13 (currently amended): The optical isolator set forth in claim [6] 8, wherein said magneto-optical section, said magnetic part, said dielectric multi-layer films, said polarizer, and said analyzer are formed integrally by a vapor-phase process.



Claim 14 (original): A polarizer lent a characteristic structure having distributed refractive indices, by irradiating with either a particle beam or an energy beam a diamond-like carbon thin film along a bias with respect to the film's thickness direction.

Claim 15 (original): The polarizer set forth in claim 14, wherein said particle beam is an ion beam, an electron beam, a proton beam,  $\alpha$  - rays, or a neutron beam; and said energy beam is light rays, X-rays or  $\gamma$  - rays.

Claim 16 (currently amended): An amorphous diamond-like carbon thin film ~~incorporating hydrogen~~, characterized in being transparent in the light region, and in having an extinction coefficient that is  $3 \times 10^{-4}$  or less at optical-communications wavelengths of from 1200 nm to 1700 nm.

Claim 17 (currently amended): An optics component, characterized by utilizing the amorphous diamond-like carbon thin film set forth in claim 16.


Claim 18 (original): The optical isolator set forth in claim 11, wherein said diamond-like carbon thin film is transparent in the light region, and has an extinction coefficient that is  $3 \times 10^{-4}$  or less at optical-communications wavelengths of from 1200 nm to 1700 nm.

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Claim 19 (original): The optical isolator set forth in claim 12, wherein said diamond-like carbon thin film is transparent in the light region, and has an extinction coefficient that is  $3 \times 10^{-4}$  or less at optical-communications wavelengths of from 1200 nm to 1700 nm.

Claim 20 (original): The polarizer set forth in claim 14, wherein said diamond-like carbon thin film is transparent in the light region, and has an extinction coefficient that is  $3 \times 10^{-4}$  or less at optical-communications wavelengths of from 1200 nm to 1700 nm.

Claim 21 (original): The polarizer set forth in claim 15, wherein said diamond-like carbon thin film is transparent in the light region, and has an extinction coefficient that is  $3 \times 10^{-4}$  or less at optical-communications wavelengths of from 1200 nm to 1700 nm.

  
JOHN JUBA, JR.  
PRIMARY EXAMINER